

CLAIMS

1. A high-voltage component comprising a first end (1) and a second end (2), wherein under operating conditions the first end (1) is on a high-voltage potential with respect to the second end (2), comprising an insulating part (3; 9, 11, 12), which is arranged between the first end (1) and the second end; and comprising at least one optical fiber (4), which is integrated in the high-voltage component and which extends from the first end (1) to the second end (2),
characterised
in that the high-voltage component comprises at least one capillary (5), which extends from the first end (1) to the second end (2) and which is arranged within the insulating part (3; 9, 11, 12);
in that the inside diameter of the capillary (5) exceeds the outside diameter of the fiber (4);
in that the fiber (4) is arranged within the capillary (5); and
in that the capillary (5) comprises a protective medium (6) to achieve a dielectric strength in the capillary (5), which dielectric strength is suitable for the operating conditions.
2. The high-voltage component according to claim 1,
characterised in that the outside of the capillary (5) is enclosed by a capillary coating (8) in order to protect said capillary (5) against mechanical stress.

3. The high-voltage component according to one of the preceding claims, **characterised in that** the capillary (5) is designed and arranged in the insulating part (3; 9, 11, 12) such that thermo-mechanical stress, which under operating conditions is exerted on said capillary (5) by the insulating part (3; 9, 11, 12), leaves it undamaged, and/or
in that the capillary (5) is designed and arranged in the insulating part (3; 9, 11, 12) such that thermo-mechanical stress, which the insulating part (3; 9, 11, 12) exerts on the capillary during the curing process of the insulation part (3; 9, 11, 12), leaves it undamaged.
4. The high-voltage component according to claim 1, **characterised in that** the fiber (4) is a polarisation-maintaining fiber (4), in particular a fiber comprising an elliptic core, a fiber comprising an inner elliptic jacket, a bowtie fiber or a panda fiber.
5. The high-voltage component according to any one of the preceding claims, **characterised in that** the fiber (4) comprises a fiber coating (7).
6. The high-voltage component according to any one of the preceding claims, **characterised in that** the fiber (4) is exchangeable without there being any need to change the insulating part (3; 9, 11, 12).
7. The high-voltage component according to any one of the preceding claims, wherein the high-voltage

component comprises an insulation body (9) which extends from the first end (1) to the second end (2), **characterised in that** the insulation body (9) differs from the insulating part (3; 11, 12) **in that** the capillary (5) is arranged in a spiral shape along the insulation body (9), and in particular **in that** the insulation body (9) is wrapped by an intermediate layer (10), and the intermediate layer (10) is arranged between the insulation body (9) and the capillary (5).

8. The high-voltage component according to any one of the preceding claims, **characterised in that** the high-voltage component comprises a current sensor and/or a voltage sensor (13).
9. The high-voltage component according to any one of the preceding claims, **characterised in that** the insulating part (3; 9, 11, 12) is a form of shielding (11) and/or an insulation filler (12) and/or an insulation body (9).
10. The high-voltage component according to any one of the preceding claims, **characterised in that** the high-voltage component is a high-voltage insulator, a high-voltage leadthrough, a high-voltage arrester or a high-voltage switch.
11. A method for producing a high-voltage component comprising a first end (1) and a second end (2), wherein under operating conditions the first end (1) is on a high-voltage potential with respect to the second end (2), and comprising an insulating

part (3; 9, 11, 12), which is arranged between the first end (1) and the second end (2),

characterised

in that between the first end (1) and the second end (2) within the insulating part (3; 9, 11, 12) at least one capillary (5) is arranged to accommodate at least one optical fiber (4); and

in that a protective medium (6) is placed in the capillary to achieve a dielectric strength in the capillary, which dielectric strength is suitable for the operating conditions.

12. The production method according to claim 11, **characterised in that** the fibre (4), of which there is at least one, is placed in the capillary (5).
13. The production method according to one of claims 11 or 12, **characterised in that** a capillary coating (8) is applied to the outside of the capillary (5) before the capillary (5) is arranged within the insulating part (3; 9, 11, 12).
14. The production method according to any one of claims 11 to 13, wherein the high-voltage component comprises an insulation body (9) which extends from the first end (1) to the second end (2), **characterised in that** the insulation body (9) differs from the insulating part (3; 11, 12) **in that** the capillary (5) is arranged in a spiral shape along the insulation body (9), and in particular **in that** the insulation body (9) is wrapped by an intermediate layer (10), and then

the capillary (5) is arranged in a spiral shape along the insulation body (9), which is wrapped by the intermediate layer (10), so that the intermediate layer (10) is arranged between the capillary (5) and the insulation body (9).

15. The production method according to any one of claims 11 to 14, **characterised in that** the capillary (5) is arranged within the insulating part (3; 9, 11, 12) prior to a curing process of the insulating part (3; 9, 11, 12) taking place.
16. The production method according to any one of claims 11 to 15, **characterised in that** the fiber (4) is placed in the capillary (5) before the capillary (5) is arranged within the insulating part (3; 9, 11, 12).
17. The production method according to any one of claims 11 to 15, **characterised in that** the fiber (4) is placed in the capillary (5) after the capillary (5) is arranged within the insulating part (3; 9, 11, 12), and/or **in that** the fiber (4) is placed in the capillary (5) in such a way that it is exchangeable.